

Report from USN0

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Civil GPS Service Interface Committee
Timing Subcommittee
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USNO GPS Activities

- ◆ **Precise Positioning Service (PPS) Operations**
- ◆ **Standard Positioning Service (SPS) Operations**
- ◆ **GPS Timing Receiver Testing**
- ◆ **Network Time Servers**
- ◆ **30th Precise Time and Time Interval (PTTI)
Systems and Applications Meeting**



USNO PPS Operations

◆ GPS Time Synchronization to UTC(USNO)

- Provide GPS with a reliable and stable reference to UTC(USNO)
- GPS Time corrections provided to GPS MCS 2 SOPS daily

◆ Block IIR On-Orbit Testing

- USNO participated in the Air Force Operational Test and Evaluation Center (AFOTEC) 90-day test
- GPS Time, UTC(via GPS) and clock data collected

◆ Multichannel PPS GPS Timing Receiver



USNO SPS Operations

◆ Common-View Time Transfer

- Incorporate USNO clocks into the computation of International Atomic Time (TAI)
- Multichannel GPS Receiver Analysis
- GLONASS
- GPS Carrier Phase.

◆ Time Steering of Remote Clocks

- Loran-C
- Precise Measurement Electronic Laboratories (PMEL)



USNO GPS Timing Receiver Testing

- ◆ Performance
- ◆ GPS Week Rollover
- ◆ Calibration



USN0 Network Time Servers

◆ Internet

- 14 U.S. Stratum-1 Time Servers
- Expansion sites planned for Alaska and Hawaii
- Millisecond Time Synchronization
- USN0 Master Clock & GPS Time References
- 250 Million Network Requests Per Month

◆ Classified DoD Internet (SIPRNET)

- 2 U.S. Stratum-1 Time Servers
- Expansion sites planned for Hawaii and Germany

USN0 NTP information available:

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202-762-1 578, DSN 762-1 578

<http://tycho.usno.navy.mil/ntp.html>



USNO Time Dissemination

USNO Service	Time Uncertainty	Estimated # of Users	Type of Users
Web Page Y2000 Countdown Real Audio Animated GIF Clock	5 seconds 4 second delay 1 second	1 0,000/month 35,000/month 3 million/month	All All All
Telephone Voice Announcer Computer Modem	0.1 second 0.01 second	63,000/month 82,000/month	All All
Leitch	0.0 1 second	15,000/month	Gov/Commercial/Univ
NTP	20 milliseconds	250 million/month	Gov/Commercial/Univ
Loran	1 microsecond	1000	Military/Civilian
GPS SPS PPS	340 nanoseconds 28 nanoseconds	300,000 100,000	All Military/Authorized
TWSTT	1 nanosecond	20	Military/Civilian

30th Precise Time and Time Interval (PTTI) Applications and Planning Meeting

◆ PTTI Objectives

- Disseminate and coordinate PTTI information at the user level;
- Inform Government and Industry engineers, technicians, and managers of precise time and frequency technology; and
- Provide an opportunity for an active exchange of new technology associated with PTTI.

◆ Meeting information

- December 1-3, 1998 in Reston, Virginia
- **Sponsors:** USNO, NRL, NASA JPL, USAF Office of Scientific Research, USAF Space Command
- **Meeting focus:** Systems of Multiple Clocks (ensembling), Time Transfer Systems, Planning for Systems Employing New Standards, Communications Applications, Computer Network Timing Applications, GPS Carrier Phase Time Transfer Applications, **Y2K**, GPS Week Rollover, Leap Seconds, Navigation Applications
- Additional information: <http://tycho.usno.navy.mil/ptti.html>